WHAT IS CLAIMED IS:

1. A mixing rotor for use in a batch mixer, the mixing rotor comprising a plurality of mixing blades, each mixing blade defining a tip clearance between a tip of the mixing blade and an inner surface of a mixing chamber where the mixing rotor is rotatably placed to impart shearing forces to a material to be mixed in the tip clearance, wherein the plurality of mixing blades include a nonlinear blade which is substantially nonlinear from a start point to a terminal point in a development of the mixing rotor developed into a plane about its longitudinal axis, and other linear blades which are linear in the development, wherein the mixing blades include a pair of longer blades twisted in such a direction as to cause the material to flow toward a longitudinal middle side of the mixing rotor, and the pair of longer blades include a first longer blade which is linear and extends from one longitudinal end of the mixing rotor toward the longitudinal middle side thereof, and a second longer blade which is nonlinear and extends from the other longitudinal end of the mixing rotor toward the longitudinal middle side thereof and whose helix angle gradually increases toward the other longitudinal end.

2. A mixing rotor according to claim 1, wherein the linear blades include a blade whose helix angle to the longitudinal axis of the mixing rotor is set at 15 to 35°.

3. A mixing rotor according to claim 1, wherein the leading end of the first longer blade at the longitudinal middle side of the mixing rotor is located at a position spaced apart from the second longer blade by 120° or larger in the circumferential direction of the mixing rotor.

4. A mixing rotor according to claim 1, wherein the mixing blades include a first shorter blade twisted in such a direction as to cause the material to flow toward the longitudinal middle side of the mixing rotor, and the first shorter blade is linear and arranged behind the first longer blade with respect to a rotational direction of the mixing rotor and extends from the one longitudinal end of the mixing rotor toward the longitudinal middle side thereof.

5. A mixing rotor according to claim 4, wherein the leading end of the first longer blade at the longitudinal middle side of the mixing rotor is located at a position spaced apart from the second longer blade by 120° or larger in the circumferential direction of the mixing rotor.

6. A mixing rotor according to claim 4, wherein the leading end of the second longer blade at the longitudinal middle side of the mixing rotor is located substantially in the

middle between the leading end of the first shorter blade at the same side and the first longer blade.

7. A mixing rotor according to claim 4, wherein the mixing blades include a second shorter blade twisted in such a direction as to cause the material to flow toward the longitudinal middle side of the mixing rotor, and the second shorter blade is linear and arranged behind the second longer blade with respect to the rotational direction of the mixing rotor and extends from the other longitudinal end of the mixing rotor toward the longitudinal middle side thereof.

8. A mixing rotor according to claim 7, wherein the leading end of the second longer blade at the longitudinal middle side of the mixing rotor is located substantially in the middle between the leading end of the first shorter blade at the same side and the first longer blade.

9. A mixing rotor according to claim 7, wherein the leading end of the first longer blade at the longitudinal middle side of the mixing rotor is located at a position spaced apart from the second longer blade by 120° or larger in the circumferential direction of the mixing rotor.

10. A mixing rotor according to claim 9, wherein the leading end of the second longer blade at the longitudinal middle side of the mixing rotor is located substantially in the middle between the leading end of the first shorter blade at the same side and the first longer blade.

11. A batch mixer comprising:

a chamber including a mixing chamber; and

a mixing rotor rotatably placed in the mixing chamber, and including a plurality of mixing blades, each mixing blade defining a tip clearance between a tip of the mixing blade and an inner surface of a mixing chamber where the mixing rotor is rotatably placed to impart shearing forces to a material to be mixed in the tip clearance, wherein the plurality of mixing blades include a nonlinear blade which is substantially nonlinear from a start point to a terminal point in a development of the mixing rotor developed into a plane about its longitudinal axis, and other linear blades which are linear in the development, wherein the mixing blades include a pair of longer blades twisted in such a direction as to cause the material to flow toward a longitudinal middle side of the mixing rotor, and the pair of longer blades include a first longer blade which is linear and extends from one longitudinal end of the mixing rotor toward the longitudinal middle side thereof, and a second longer blade which is nonlinear and extends from

the other longitudinal end of the mixing rotor toward the longitudinal middle side thereof and whose helix angle gradually increases toward the other longitudinal end.

12. A batch mixer according to claim 11, wherein the linear blades include a blade whose helix angle to the longitudinal axis of the mixing rotor is set at 15 to 35°.

13. A batch mixer according to claim 11, wherein the leading end of the first longer blade at the longitudinal middle side of the mixing rotor is located at a position spaced apart from the second longer blade by 120° or larger in the circumferential direction of the mixing rotor.

14. A batch mixer according to claim 11, wherein the mixing blades include a first shorter blade twisted in such a direction as to cause the material to flow toward the longitudinal middle side of the mixing rotor, and the first shorter blade is linear and arranged behind the first longer blade with respect to a rotational direction of the mixing rotor and extends from the one longitudinal end of the mixing rotor toward the longitudinal middle side thereof.

15. A batch mixer according to claim 14, wherein the leading end of the first longer blade at the longitudinal middle

side of the mixing rotor is located at a position spaced apart from the second longer blade by 120° or larger in the circumferential direction of the mixing rotor.

16. A batch mixer according to claim 14, wherein the leading end of the second longer blade at the longitudinal middle side of the mixing rotor is located substantially in the middle between the leading end of the first shorter blade at the same side and the first longer blade.

17. A batch mixer according to claim 14, wherein the mixing blades include a second shorter blade twisted in such a direction as to cause the material to flow toward the longitudinal middle side of the mixing rotor, and the second shorter blade is linear and arranged behind the second longer blade with respect to the rotational direction of the mixing rotor and extends from the other longitudinal end of the mixing rotor toward the longitudinal middle side thereof.

18. A batch mixer according to claim 17, wherein the leading end of the second longer blade at the longitudinal middle side of the mixing rotor is located substantially in the middle between the leading end of the first shorter blade at the same side and the first longer blade.

19. A batch mixer according to claim 17, wherein the leading end of the first longer blade at the longitudinal middle side of the mixing rotor is located at a position spaced apart from the second longer blade by 120° or larger in the circumferential direction of the mixing rotor.

20. A batch mixer according to claim 19, wherein the leading end of the second longer blade at the longitudinal middle side of the mixing rotor is located substantially in the middle between the leading end of the first shorter blade at the same side and the first longer blade.